

LSST AND FLOWS OF CATAclysmic VARIABLE STARS

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ABSTRACT

Cataclysmic variables (CVs) are interacting binary stars in which matter flows from a main-sequence donor to a white dwarf, often forming an accretion disc. Brightness variability in CVs—such as bursts, flickering, and superhumps — usually arises from instabilities in the accretion flow, turbulence, and angular momentum transport. Spectral diagnostics from emission and absorption lines of ionized elements and molecular bands provide insights into temperature, density, velocity fields, and chemical composition.

CVs are often treated as scaled-down laboratories of AGN accretion physics, allowing accretion processes to be studied on much shorter timescales (seconds–days instead of years–centuries) while retaining analogous disc physics. The Vera C. Rubin Observatory (LSST) will provide real-time alerts for variable and transient events, enabling rapid detection of CV outbursts, coordinated follow-up, and detailed studies of the physical mechanisms driving variability.

We will present here our current work on an LSST broker orchestrator which will enable rich scientific use of the cases for CVs, and will facilitate real-time filtering and follow-up of transient events (work in progress). These observations will advance our understanding of accretion dynamics and the microphysical origins of variability in interacting binary systems.

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